## REMARKS

Claims 1-6, 8-16, and 18-22 are pending in the present application. By this response, claims 1, 5, 11, and 15 are amended, claims 7 and 17 are canceled and claims 21 and 22 are added. Claims 1 and 11 are amended to incorporate subject matter previously presented in claims 7 and 17. Additional support for these amendments may be found at least on page 10, line 24 to page 12, line 7 of the present specification. Claims 5 and 15 are amended for minor informalities and proper claim format. Support for newly added claims 21 and 22 may be found at least on page 12, line 8 to page 13, line 25 of the present specification. Reconsideration of the claims in view of the above amendments and the following remarks is respectfully requested.

### I. 35 U.S.C. § 102, Alleged Anticipation, Claims 1-7 and 9-10

The Office Action rejects claims 1-7 and 9-10 under 35 U.S.C. § 102(b) as being anticipated by Collins (U.S. Patent No. 4,607,808). This rejection is respectfully traversed.

As to claims 1-7 and 9-10, the Office Action states:

> With respect to Claims 1-7 and 9-10, Collins, Figures 3 and 4, teaches a tape guide roller the tape guide roller comprising: a tape guide surface, wherein at least one portion of the tape guide surface is curved and wherein at least another portion of the tape guide surface has substantially zero curvature; at least one hard stop portion on at least one end of the tape guide surface; wherein the at least one hard stop at an elevation higher than the tape guide surface; wherein the tape guide surface has a surface with cylindrical symmetry; the cylindrical symmetry of the tape guide surface has a curvature defined by a function and wherein the function is one of a linear function and a nonlinear function; wherein the function is one of an exponential, brachistochrone, quadratic polynomial, cubic polynomial, or higher order polynomial; wherein the tape guide surface provides a restoring force to a tape media to move the tape media to an optimal position; wherein the tape guide surface has a negative curvature; wherein the tape guide roller is one of flanged, unflanged, spinning, stationary, contoured or not contoured.

Office Action dated March 16, 2005, page 2.

Claim 1 reads as follows:

> 1. A tape guide roller for maintaining a position of tape media, the tape guide roller comprising:
>
> a first portion of a tape guide surface that has a first curvature;
>
> a second portion of the tape guide surface that has substantially zero curvature; and
>
> a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re bond*, 910 F .2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 21 U.S.P.Q.2d 1031, 1034 (Fed Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. Kalman v. Kimberly-Clark Corp., 713 F .2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that Collins does not teach every element of the claimed invention arranged as they are in the claims. Specifically, Collins does not teach a first portion of a tape guide surface that has a first curvature, a second portion of the tape guide surface that has substantially zero curvature, and a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion.

Collins teaches a conductive, carbon-filled acetal resin capstan within a belt driven tape cartridge is rotatably supported by a pin and includes a cylindrical outer surface for engaging a drive belt. The capstan is electrically conductive to dissipate static electrical charges and includes a polytetrafluoroethylene-filled acetal resin sleeve interposed between the pin and the capstan to increase the wear resistance of the capstan where it frictionally engages the cartridge.

The Office Action alleges that Collins teaches the presently claimed features in Figures 3 and 4, which are shown as follows:

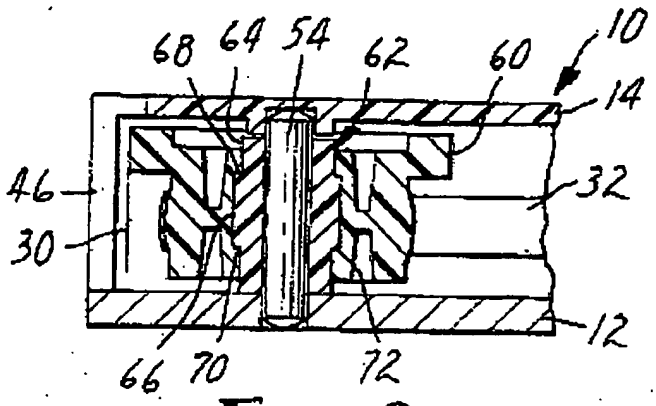


FIG. 3

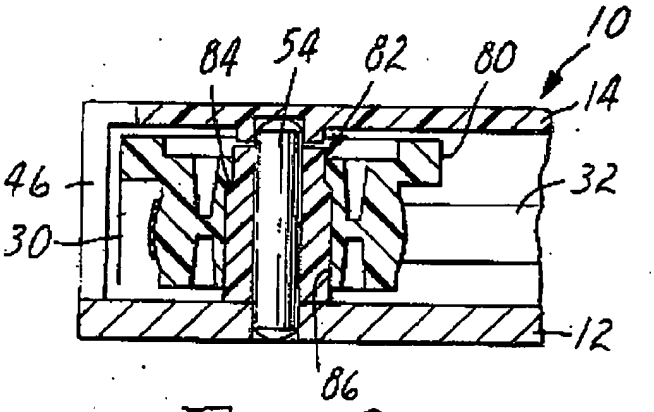


FIG. 4

Collins' supporting description of Figures 3 and 4 reads as follows:

> The improved version is shown in FIG. 3, wherein a capstan 60, manufactured of conductive, carbon-filled acetal resin, is provided with an inner sleeve 62 which is manufactured of plain acetal resin or, preferably, polytetrafluoroethylene-filled acetal resin. Adequate wear characteristics would probably result if the sleeve 62 were manufactured of plain acetal resin, but polytetrafluoroethylene enhances the wear resistance properties of acetal resin, and, therefore, a polytetrafluoroethylene-filled acetal resin for the sleeve 62 is preferred.
>
> The capstan 60 of FIG. 3 is preferably molded as the second step of a two-step process in which the sleeve 62 is molded and then placed within a secondary mold which produces the capstan 60. The sleeve 62 includes a cylindrical body 64 which is provided with a raised diameter 66 located approximately midway along the length of the sleeve 62. The

purpose of the increased diameter 66 is to provide horizontal shoulders 68 and 70 which axially lock the sleeve 62 to the central hub 72 of the capstan 60.

Operation of the sleeve 62 and capstan 60 assembly of FIG. 3 has revealed that wear is greatly reduced and also that a detrimental static electrical charge is not produced on the capstan 60. This result is somewhat surprising since the acetal resin or polytetrafluoroethylene-filled acetal resin which comprises the sleeve 62 is nonconductive and, therefore, provides no conductive path to ground for a static charge induced on the capstan 60. The absence of a static electrical charge on the capstan 60 is not completely understood, but it is believed that the use of conductive, carbon-filled acetal resin allows the static charge to relocate and neutralize itself within the polymer structure of the capstan 60.

FIG. 4 illustrates an alternate embodiment of a capstan 80 and a sleeve 82 which is provided with only a single shoulder 84 rather than the two shoulders 68 and 70 illustrated in FIG. 3. The provision of a single shoulder 84 has been shown to be adequate to prevent relative axial movement between the sleeve 84 and the capstan 80, and allows the sleeve 82 and the capstan 80 to be molded as completely separate parts and later assembled by press fitting the sleeve 82 into a matching bore 86 molded in the capstan 80. The capstan 80 of FIG. 4, however, could also be molded in a two-step process as described with respect to FIG. 3 by first molding the sleeve 82 and inserting this molded part into a subsequent mold used to form the capstan 80.

In these Figures and related description, Collins describes the curvature of capstan 60 on which drive belt 32 runs. Capstan 60 of Collins is not a tape bearing surface. That is, tape 30 never comes in contact with capstan 60. Drive roller 48 contacts drive belt 32 driving capstan 60. Drive belt 32 driving capstan 60 is provided with reduced diameter 51 to prevent contact between driving belt 32 and drive roller 48. Collins clearly describes that the contact of driving belt 32 with drive capstan 60 can be made to have a cylindrical outer surface engaging drive belt 32. Thus, Collins refers to the curvature of the roller, capstan 60, for drive belt 32. The presently claimed invention is directed to a tape guide surface, wherein at least one portion of the tape guide surface is curved and wherein at least another portion of the tape guide surface has substantially zero curvature. Furthermore, even if Collin's capstan were considered to be a tape guide surface, which it is not, the capstan surface is completely curved by reduced diameter 51. Thus, the capstan of Collin does not have at least another portion of a tape guide surface that has substantially zero curvature.

Independent claim 11 recites similar features in its respective claim terminology. Independent claim 11 recites "a first portion of a tape guide surface that has a first curvature, a second portion of the tape guide surface that has substantially zero curvature, and a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion."

Thus, Collins does not teach each and every feature of independent claims 1 and 11 as is required under 35 U.S.C. § 102. At least by virtue of their dependency on independent claims 1 and 11, the specific features of dependent claims 2-6, 9, 12-16, and 18-20 are not taught by Collins. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-6, 9-16, and 18-20 under 35 U.S.C. § 102.

Furthermore, Collins does not teach, suggest or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement Collins such that a tape guide surface has at least one portion that is curved and at least another portion that has substantially zero curvature, one of ordinary skill in the art would not be led to modify Collins to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify Collins in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

Moreover, in addition to their dependency from independent claims 1 and 11, the specific features recited in dependent claims 2-6, 9, 12-16, and 18-20 are not taught by Collins. For example, with regard to claims 5 and 15, Collins does not teach that the cylindrical symmetry of the tape guide surface has a curvature defined by a function and wherein the function is a linear function or a nonlinear function. As discussed above, Collins describes the curvature of the capstan has a reduced diameter. Collins makes no mention of the capstan being defined by a function, where the function is one of a linear function and a non linear function. In fact, the term "function" does not appear in the Collins reference.

As an additional example, with regard to claim 6 and 16, Collins does not teach a function that is one of an exponential, brachistochrone, quadratic polynomial, cubic polynomial, or higher order polynomial. As discussed above, Collins does not teach a tape guide service that has a curvature that is defined by a function. Furthermore, not one of the functions recited in these claims appears in the Collins reference.

As a further example, with regard to claims 8 and 18, Collins does not teach a tape guide surface that has a positive curvature. Collins only teaches a capstan, which is not a tape guide surface, that that has a negative curvature with a reduced diameter.

Therefore, in addition to being dependent on independent claims 1 and 11 dependent claims 2-6, 9, 12-16, and 18-20 are also distinguishable over Collins by virtue of the specific features recited in these claims. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2-6, 9, 12-16, and 18-20 under 35 U.S.C. § 102.

## II. 35 U.S.C. § 102, Alleged Anticipation, Claims 1-8 and 10-20

The Office Action rejects claims 1-8 and 10-20 under 35 U.S.C. § 102(b) as being anticipated by Cope et al. (U.S. Patent No. 6,320,727). This rejection is respectfully traversed.

As to claims 1-8 and 10-20, the Office Action states:

> With respect to Claims 1-8 and 10, Cope et al., Figures 3 and 4, teaches a tape guide roller the tape guide roller comprising: a tape guide surface, wherein at least one portion of the tape guide surface is curved and wherein at least another portion of the tape guide surface has substantially zero curvature; at least one hard stop portion on at least one end of the tape guide surface; wherein the at least one hard stop at an elevation higher than the tape guide surface; wherein the tape guide surface has surface with cylindrical symmetry; the cylindrical symmetry of the tape guide surface has a curvature defined by a function and wherein the function is one of a linear function and a nonlinear function; wherein the function is one of an exponential, brachistochrone, quadratic polynomial, cubic polynomial, or higher order polynomial; wherein the tape guide surface provides a restoring force to a tape media to move the tape media to an optimal position; wherein the tape guide surface has a positive curvature; wherein the tape guide roller is one of flanged, unflanged, spinning, stationary, contoured or not contoured.

With respect to Claim 11-20, Cope et al, Figures 3 and 4, teach a tape feeding mechanism comprising at least one tape reel 118, a read/write head 120; a tape guide roller 102,104,106,108 the tape guide roller comprising: a tape guide surface, wherein at least one portion of the tape guide surface is curved 305 and wherein at least another portion of the tape guide surface has substantially zero curvature 301; at least one hard stop 302 portion on at least one end of the tape guide surface; wherein the at least one hard stop at an elevation higher than the tape guide surface; wherein the tape guide surface has a surface with cylindrical symmetry; the cylindrical symmetry of the tape guide surface has a curvature defined by a function and wherein the function is one of a linear function and a nonlinear function; wherein the function is one of an exponential, brachistochrone, quadratic polynomial, cubic polynomial, or higher order polynomial; wherein the tape guide surface provides a restoring force to a tape media to move the tape media to an optical position; wherein the tape guide surface has a positive curvature; wherein the tape guide roller is one of flanged, unflanged, spinning, stationary, contoured or not contoured.

Office Action dated March 16, 2005, pages 3-4.

Claim 1 reads as follows:

1. A tape guide roller for maintaining a position of tape media, the tape guide roller comprising:

a first portion of a tape guide surface that has a first curvature;

a second portion of the tape guide surface that has substantially zero curvature; and

a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re bond*, 910 F .2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 21 U.S.P.Q.2d 1031, 1034 (Fed Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. Kalman v. Kimberly-Clark Corp., 713 F .2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that Collins does not teach every element of the claimed invention

arranged as they are in the claims. Specifically, Cope does not teach a first portion of a tape guide surface that has a first curvature, a second portion of the tape guide surface that has substantially zero curvature, and a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion.

Cope teaches a roller guiding system for delivery of magnetic tape media along a tape path between a tape drive employing a single reel and a tape cartridge employing a single reel. The roller guiding system comprises a plurality of guide rollers configured to adjust the path of travel of the tape media during tape drive operation to maintain tracking of the tape media with a tape head.

The Office Action alleges that Cope teaches the presently claimed features in Figures 3 and 4, which are shown as follows:

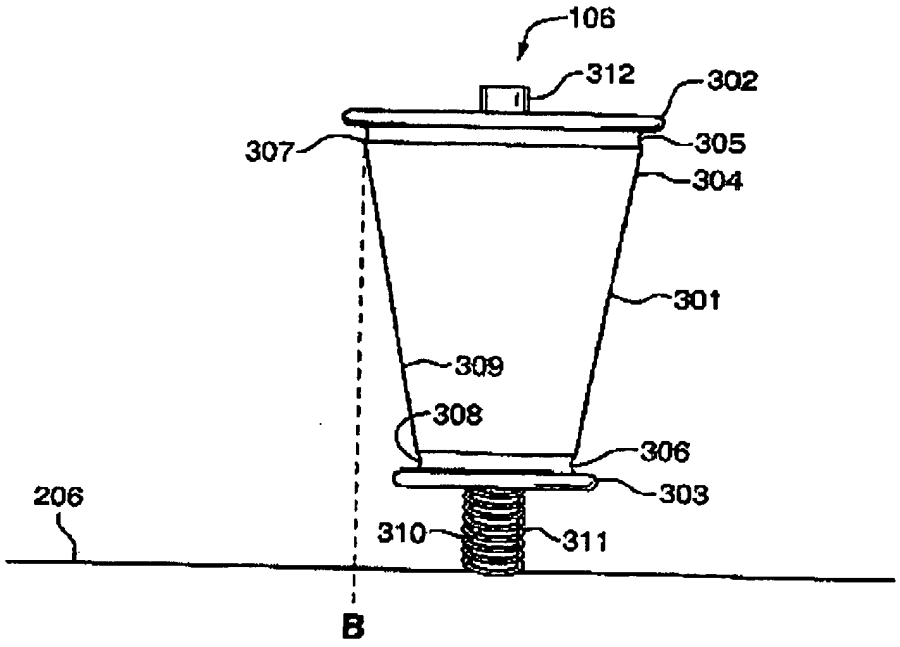


FIG. 3

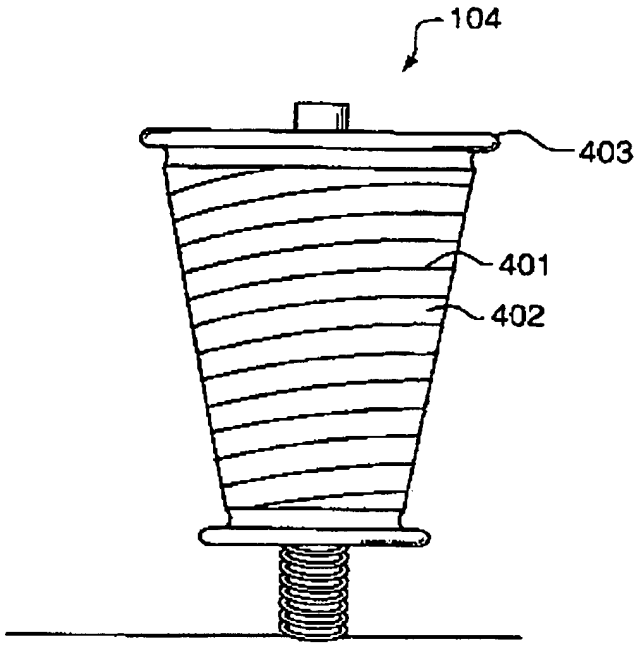


FIG. 4

Cope's supporting description of Figures 3 and 4 reads as follows:

> FIG. 3 illustrates a perspective view of guide roller 106 of the present invention. Guide roller 106 also comprises a pair of circular disks 302 and 303 integrally formed around the top and bottom of a main body 304. Main body 304 includes a tape media contact surface 301 circumscribing main body 304 and disposed between channels 305 and 306. Channels 305 and 306 are formed around the top and the bottom of tape media contact surface 301 and are functionally equivalent to channels 212 and 201 on guide roller 108.
>
> Tape media contact surface 301 is tapered inward from top 307 to bottom 308 between channels 305 and 306. In preferred embodiments, the slope 309 of tape media contact surface 301 with respect to datum line B is in the range of 0.1 inches and 0.2 inches and more preferably is 0.143 inches. Similar to tape media contact surface 211 on guide roller 108, tape media contact surface 301 is dimensioned slightly wider than tape media 112 permitting tape media 112 to pass between disks 302 and 303 without contacting both simultaneously. In preferred embodiments, the vertical distance of tape media contact surface 301 not including channels 305 and 306 is in the range of 0.4985 inches and 0.4991 inches and more preferably is 0.4988 inches.

> Guide roller 106 is rotatably mounted on post 310. Guide roller 106 includes internal bearings and races to permit rotation around post 310. As with guide roller 108 a preferred exemplary bearing and race combination is an ABEC 5 bearing and ABEC 5 race. A spring 311 around the lower portion of post 310, and nut 312 threaded on the top portion of post 310, permit height adjustment of guide roller 106 relative to tape drive deck 206.
>
> FIG. 4 illustrates a perspective view of guide roller 104 of the present invention. Guide roller 104 is identical to guide roller 106 with the exception of grooves 401 circumscribing tape media contact surface 402. Grooves 401 provide additional traction at guide roller 104 to maintain constant tension in tape media 112 and prevent tension buildup during tape drive operation. The traction prevents slipping of tape media 112 as it travels over guide rollers 102, 104, 106 and 108. Slipping causes errors in alignment of a specific tape track with tape head 120. Grooves 401 provide added traction and prevent slipping by bleeding excess air from between tape media contact surface 402 and tape media 112.
>
> An especially preferred feature of the invention is the spiraling of grooves 401. Grooves 401 are configured to spiral around tape media contact surface 402 to reduce dipping. Dipping is a deformation of tape media 112 into grooves configured in a vertically parallel orientation. Dipping is caused by constant contact between the vertically parallel grooves and the same vertical location on tape media 112. The spiraling of grooves 401 continually changes the point of contact to reduce the dipping as tape media 112 passes over guide roller 104.

In these Figures and related description, Cope describes a tape guide roller that has a tape guide surface 301 which is tapered. Channels 305 and 306 are described by Cope as Channels 305 and 306 are formed around the top and the bottom of tape media contact surface 301 and are functionally equivalent to channels 212 and 201 on guide roller 108. Channels 212 and 201 aid in manufacturing guide roller 108 by forming a right angle at the contact point between tape media 112 and the respective surface of disks 209 and 210. Thus, channels 212 and 201, and similarly channels 305 and 306, are not part of the tape guide surface, do not come in contact with the tape media, and are only provided in order to ease in the manufacturing of hard stops 302 and 303. In fact, Cope clearly states that tape media contact surface 301 is tapered inward from top 307 to bottom 308 between channels 305 and 306. Thus, channels 305 and 306 are not part of a tape guide surface and Cope does not teach a tape guide surface, wherein at least one portion of the

tape guide surface is curved and wherein at least another portion of the tape guide surface has substantially zero curvature.

Furthermore, in Figure 2, Cope describes a roller with three sections that overall has negative curvature but is made up of three linear sections with positive slope 203, infinite slope 204, a vertical line, and negative slope 205. Cope teaches that the central crown 214 if formed by the tapered slope of tape media contact surface 211 in sections 203 and 205. In other words, Cope connects the three surfaces with three lines of different, but constant, slope. Although Cope teaches that alternative designs such as an arcuate crown can be used, the definition of arcuate is: having the form of a bow; curved. That would imply that the entire media contact surface 211 is curved and that Cope only applies to negative curvature and not to the positive curvature possibilities.

Independent claim 11 recites similar features in its respective claim terminology. Independent claim 11 recites "a first portion of a tape guide surface that has a first curvature, a second portion of the tape guide surface that has substantially zero curvature, and a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion."

Thus, Cope does not teach each and every feature of independent claims 1 and 11 as is required under 35 U.S.C. § 102. At least by virtue of their dependency on independent claims 1 and 11, the specific features of dependent claims 2-6, 8, 10, 12-16, and 18-20 are not taught by Cope. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-6, 8, 10-16, and 18-20 under 35 U.S.C. § 102.

Furthermore, Cope does not teach, suggest or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement Cope such that a tape guide surface has at least one portion that is curved and at least another portion that has substantially zero curvature, one of ordinary skill in the art would not be led to modify Cope to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion or incentive to modify Cope in this manner, the presently claimed invention

can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

Moreover, in addition to their dependency from independent claims 1 and 11, the specific features recited in dependent claims 2-6, 8, 10, 12-16, and 18-20 are not taught by Cope. For example, with regard to claims 5 and 15, Cope does not teach that the cylindrical symmetry of the tape guide surface has a curvature defined by a function and wherein the function is one of a linear function and a nonlinear function. As discussed above, Cope describes a tape media contact surface that is only linear. Cope makes no mention of the tape media contact surface being defined by a function, where the function is one of a linear function and a non linear function.

As an additional example, with regard to claim 6 and 16, Cope does not teach a function that is one of an exponential, brachistochrone, quadratic polynomial, cubic polynomial, or higher order polynomial. As discussed above, Cope does not teach a tape guide service that has a curvature that is defined by a function. Furthermore, not one of the functions recited in these claims appears in the Cope reference.

As a further example, with regard to claims 8 and 18, Cope does not teach a tape guide surface that has a positive curvature. Cope only teaches a capstan, which is not a tape guide surface, that that has a negative curvature with a reduced diameter.

Therefore, in addition to being dependent on independent claims 1 and 11 dependent claims 2-6, 8, 10, 12-16, and 18-20 are also distinguishable over Cope by virtue of the specific features recited in these claims. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2-6, 8, 10, 12-16, and 18-20 under 35 U.S.C. § 102.

## III. New Claims

Claims 21 and 22 are added to the pending application. The features in these claims are supported in the specification at least on page 12, line 8 to page 13, line 25 and Figures 6, 7A and 7B of the present specification. Consequently, no new matter is added. Claim 21 reads as follows:

21. A tape feeding mechanism for maintaining the position of tape media, the tape feeding mechanism comprising:

at least one tape reel;

a read/write head;

a first tape guide roller; and

a second tape guide roller, wherein the first tape guide roller and the second tape guide roller include:

a first portion of a tape guide surface that has a positive curvature;

a second portion of the tape guide surface that has substantially zero curvature;

a third portion of the tape guide surface that has a negative curvature, wherein the second portion is positioned between the first portion and the third portion,

wherein the first tape guide roller is positioned in opposition to the second tape guide roller such that the first tape guide roller and the second tape guide roller provide an opposing restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion of both the first tape guide roller and the second tape guide roller.

As discussed above, both Collins or Cope fail to teach a first portion of a tape guide surface that has a first curvature, a second portion of the tape guide surface that has substantially zero curvature, and a third portion of the tape guide surface that has a second curvature, wherein the second portion is positioned between the first portion and the third portion and wherein the first curvature and the third curvature provide a restoring force to the tape media to move the tape media to an optimal position substantially centered over the second portion. Additionally, neither Collins nor Cope teach the features presently recited in claim 21. Claim 22 is similar in subject matter to claims 2 and 12.

## IV. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

DATE: June 13, 2005

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